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REMARKS

Applicant concurrently files herewith a Petition (and fee) for a One-Month Extension of Time.

Claims 1-20, all the claims presently pending in the application, stand rejected on prior art grounds.

Regarding the prior art rejections, claims 1-20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cheng (U.S. Pat. No. 6,259,708) in view of Kaplan (U.S. Pat. No. 6,141,339).

The rejection is respectfully traversed in view of the following discussion.

Entry of this §1.116 Response is proper. Since the response narrows the issues for appeal, such a response does not raise a new issue requiring further search and/or consideration by the Examiner. As such, entry of this Response is believed to proper and is earnestly solicited.

I. THE CLAIMED INVENTION

Applicant's invention, as disclosed and defined in claim 1, is directed to an asymmetrical digital subscriber line (ADSL) system for transferring an analog audio signal of analog communication equipment and high speed digital data of high speed digital data equipment provided on the side of a subscriber, from and to a station, through one subscriber line that includes an apparatus on the subscriber side in which an analog audio signal of the analog communication equipment is converted into a digital audio signal, the subscriber side apparatus comprising a line concentrator to concentrate the digital audio signal together with the high-speed digital data by time division, and supplied to the subscriber line after being

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modulated by a first ADSL modem, while after a signal received from the station through the subscriber line is demodulated by the first ADSL modem, the digital audio signal is converted into an analog audio signal and supplied to the analog communication equipment, and at the same time high-speed digital data is supplied to a high-speed digital data equipment.

The invention also includes an apparatus on the station side in which a signal received from the apparatus on the subscriber side through the subscriber line is demodulated by a second ADSL modem, thereafter the digital audio signal is converted into an analog audio signal, which is supplied to an analog telephone network, and at the same time high-speed digital data is supplied to a high-speed digital data network, while an analog audio signal of the analog telephone network is converted into a digital audio signal, the station side apparatus comprising a line concentrator to concentrate the digital audio signal together with high-speed digital data of the high-speed digital data network by time division, and supplied to the subscriber line after being modulated by the second ADSL modem.

An important feature of the invention is that the apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as each high-speed digital data into asynchronous transfer mode (ATM) cells in each respective line concentrator using time division.

As a result, the present invention provides a more efficient system for transferring an analog audio signal and a high-speed digital data signal together through the same ADSL subscriber line without using a plain old telephone system (POTS) splitter on the subscriber side and station side.

In contrast, a conventional ADSL system must contain a POTS (plain old telephone system) splitter, which is an integrated separator (e.g., a filter) for separating an analog audio

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signal and high-speed digital data, on both sides of a station and subscriber.

The claimed invention, however, uses analog-to-digital/digital-to-analog (AD/DA) convertors to convert the analog signal to digital and multiplex the digital audio and data together on a single line using a time division method. The multiplexed signal is then converted to ATM cells for transport between the subscriber and the station.

II. THE PRIOR ART REJECTION

THE CHENG AND KAPLAN REFERENCES

The Examiner submits that the claimed invention is unpatentable over Cheng in view of Kaplan. Applicant submits, however, that there are elements of the claimed invention that are neither taught nor suggested by the Examiner's urged combination of references.

Applicant submits that Cheng and Kaplan would not have been combined as alleged by the Examiner. Specifically, Cheng discloses a device configured to receive digitized voiceband signals and intersperse them into an upstream DSL signal stream to a central office facility (col. 2, lines 49-54). On the other hand, Kaplan discloses a system where communication in ATM formats are transmitted over a DSL line (col. 2, lines 1-10). Kaplan states that "prior systems do not contemplate converting the voice traffic to ATM before it is placed on the DSL local loop. This is because standard class 5 switches on the network side of the local loop do not typically handle ATM voice traffic. . . as a result, POTS traffic carried by a DSL local loop still requires processing by a complex and expensive class 5 switch," (col. 1, lines 41-52). Thus, the DSL loop of Cheng is a system requiring complex and expensive class 5 switches and would not have been combined with Kaplan's techniques.

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Given these disparate objects, problems allegedly solved, and the unusual solutions offered, the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged.

The prior art references themselves must suggest the desirability, and thus the obviousness, of making the combination, independent of the present invention and a thorough reading of Applicant's own specification. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. Certainly, no person of ordinary skill in the art would consider combining such divergent references, absent hindsight.

However, even if combined, Applicant submits that the combination would not teach each and every element of the claimed invention.

First, without a citation or reference, the Examiner states that "since the system combines two types of data streams together using ATM, the system would inherently use some type of time division to combine the packets because the ATM cells are of a fixed length and would each require a certain amount of time to be transmitted. Specific time slots would have to be allocated to transmit the different cells." The Applicant respectfully submits that the Examiner is incorrect.

The Examiner admits that Cheng does not teach that the voice signal and DSL data stream are concentrated on lines in a way of time division. In essence, the Examiner agrees that neither Cheng nor Kaplan discloses sending voice over ATM using time division.

Further, one skilled in the art would not have used time division for voice over ATM. It is well known that all T-carriers are based on time division multiplexing, where each device which communicates over a T-1 line is assigned a time slot. However, in the conventional

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techniques and systems, ATM does not assign specific time slots to each device, rather, only transmitted bits use bandwidth. Further, the Examiner's cited references do not teach or suggest voice over ATM using time division multiplexing. Indeed, there is no teaching or suggestion of "said station side apparatus comprising a line concentrator to concentrate the digital audio signal together with high-speed digital data of the high-speed digital data network by time division, and supplied to the subscriber line after being modulated by the second ADSL modem," as recited in claim 1 and substantially in claims 7 and 15.

In conventional systems, ATM sites support multiple, parallel communications. "For example, a videoconference can be taking place on the same line that large files are downloaded between the same sites. Thus, even though there is only one physical connection, multiple communications are taking place in parallel. Each of these transmissions is routed over predefined paths."¹

Further, it would not have been obvious to one skilled in the art to use time division for voice over ATM networks, as described in the context of the claims. "The Essential Guide to Telecommunications," which is certainly written by one skilled in the art, states:

Newer transmission techniques such as ATM and IP do not assign specific time slots to each device. Rather, only transmitted bits use bandwidth. this results in a more efficient use of transmission capacity.²

Therefore it is not obvious to use time division over ATM to transmit voice and data

¹ See Annalbel Z. Dodd, "The Essential Guide to Telecommunications", 2d Ed., Pub. Prentice Hall, (2000), p. 213.

² See Id., p. 186 (a copy of which is included for the Examiner's convenience).

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through a line concentrator that concentrates the digital audio signal together with high-speed digital data of a high-speed digital data network, and furthermore there is no teaching or suggestion of concentrating the digital audio signal together with high-speed digital data of the high-speed digital data network by time division, in the context of claims 1, 7, and 15. Therefore the conclusory statement by the Examiner, that an ATM network that carries voice would “obviously” use time division is an incorrect assumption without basis.

Further, Cheng relies on switching mechanisms that provide the means by which the signal path of signals flowing between DSL compliant device 10 and a central office 1. The switching mechanisms must be able to operate either in an analog terminal mode 3 or as a digital voiceband unit 7 through the switching mechanism (Cheng, col. 4, lines 10-45). These switches do not handle voice over ATM. Voice over ATM transmissions require separate, broadband networks and nodes to function. Compare Figures 1 and 2 of Cheng with Figures 1 and 2 of Kaplan, Kaplan’s access to the POTS service 160 is through special service nodes 140 that take a transmission signal off of ATM network 150. This is sharply contrasted to the fact that Cheng requires transmission through a CO with analog and digital switches that are incompatible with ATM transmissions (see Kaplan, col. 1, lines 45-50).

Thus, turning to the exemplary language of claim 1, neither Cheng nor Kaplan teaches, or for that matter renders obvious, the claimed invention of “[a]n asymmetrical digital subscriber line (ADSL) system for transferring an analog audio signal of an analog communication equipment and high speed digital data of a high speed digital data equipment provided on the side of a subscriber, from and to a station, through one subscriber line, comprising:

an apparatus on the subscriber side in which an analog audio signal of the analog

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communication equipment is converted into a digital audio signal,

said subscriber side apparatus comprising a line concentrator to concentrate the digital audio signal together with the high-speed digital data by time division, and supplied to the subscriber line after being modulated by a first ADSL modem, while after a signal received from the station through the subscriber line is demodulated by the first ADSL modem, the digital audio signal is converted into an analog audio signal and supplied to the analog communication equipment, and at the same time high-speed digital data is supplied to the high-speed digital data equipment; and

an apparatus on the station side in which a signal received from said apparatus on the subscriber side through the subscriber line is demodulated by a second ADSL modem, thereafter the digital audio signal is converted into an analog audio signal, which is supplied to an analog telephone network, and at the same time high-speed digital data is supplied to a high-speed digital data network, while an analog audio signal of the analog telephone network is converted into a digital audio signal,

said station side apparatus comprising a line concentrator to concentrate the digital audio signal together with high-speed digital data of the high-speed digital data network by time division, and supplied to the subscriber line after being modulated by the second ADSL modem,

wherein said apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as each high-speed digital data into asynchronous transfer mode (ATM) cells in each respective line concentrator and attach each destination address to the ATM cells,” as recited in claim 1 (emphasis Applicant’s).

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For at least the reasons stated above, Applicant respectfully submits that the cited references fail to teach or suggest every feature of independent claims 1-20. Therefore, the subject matters of claims 1-20 are fully patentable over the cited references.

Based on the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejection.

III. INFORMAL MATTERS AND CONCLUSION

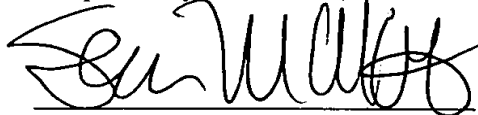
In view of the foregoing, Applicant submits that claims 1-20, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to withdraw the rejection and pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner may contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

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Respectfully Submitted,



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